

**DE PLANTIS TOXICARIIS E MUNDO NOVO
TROPICALE COMMENTATIONES XVII**

Virola as an oral hallucinogen
among the Boras of Peru*

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The hallucinogenic use of *Virola* bark was first reported from Amazonian Colombia in 1954 (Schultes, 1954), and preparation of a psychoactive snuff from a red, resin-like substance in the bark was described. Later investigations in Colombia and Brazil extended our knowledge of the use and methods of preparing this snuff in a variety of tribes (Biocca, 1966; Schultes & Holmstedt, 1968; Prance, 1970, 1972).

In 1969, the custom of orally ingesting a paste made from the bark of *Virola* was first reported from information received from a Witoto Indian resident in the Leticia region of Colombia (Schultes, 1969). These natives no longer use the drug, but they remember its preparation by the older generations.

Later, in April 1970, more intensive field studies in the Río Karaparaná area of Amazonian Colombia, where Witoto medicine men still employ *Virola* in witchcraft and medicine, clarified several points of uncertainty concerning the preparation and use of the orally administered resin. The method followed by these Karaparaná Witotos in making the thick paste from which small balls or pellets are shaped was fully described in 1976 (Schultes & Swain, 1976). It was pointed out that even in the "one limited area of the Witoto country along the Karaparaná, the preparation of orally administered *Virola* resin varies appreciably from one Indian village to another and

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likewise in accord with the way in which the drug is to be utilized.”

In April-May 1977, while on Phase VII of the Alpha-Helix Amazon Expedition, 1976-1977, we had an opportunity to carry out ethnotoxicological investigations in the region of Pebas in Amazonian Peru, where the numerically most important Indians belong to the Witoto and Bora tribes. Many of these Indians, originally from the Colombian region of the Ríos Karaparaná and Igaraparaná, were transplanted to the Pebas region in the 1930's. Substantial populations still live in the Karaparaná-Igaraparaná region under Colombian jurisdiction, and there is still some contact between the several groups.

Many of the Witotos in the Pebas area are now so acculturated that even the older men — although some know the kinds of *Virola* once employed for the drug — no longer are familiar with the relatively simple methods of elaborating the pellets for hallucinogenic use. The Boras, on the other hand, are somewhat less acculturated and conserve many of their older tribal customs, notwithstanding the inroads of Western religious and civil influences.

We were able to witness on several occasions the preparation of the *Virola* paste amongst a group of Boras living in Brillo Nuevo on the Río Yaguasyacu, an affluent of the Río Ampiyacu which, in turn, empties into the Amazonas at the town of Pebas. These Boras no longer take *Virola*, or *cumala*, as it is commonly known in Peru, for hallucinogenic purposes of witchcraft, but older members of the group still remember how their elders prepared and used the drug. Knowledge of the methods of preparation of the product has been handed down even to the younger generation.

What has apparently often been forgotten, we found, is which of the sundry species of *Virola* in the forests of the region were chosen for their psychoactivity and which were eschewed. Consequently, we had the Indians prepare paste from all of the species available and later sorted them out chemically in the laboratory: some containing the active tryptamines, others lacking these indolic compounds. A phytochemical summary of these analyses will be the subject of a later paper. We are here interested primarily in outlining the methods em-

ployed in the elaboration of the paste and a comparison of these methods with those followed by the Witoto Indians of the same original geographic area.

The Karaparaná Witotos select their trees by slashing a small strip of bark and tasting, sniffing and feeling the cambial layer, discarding trees which did not meet the right criteria: an ample cambial layer, bitter to taste and with a musty odour. That this custom is part of an old tradition was confirmed by an elderly Bora from the village of Tierra Firme on the Río Ampiyacu who selected several *Virolas* and classified them according to their potency (which later chemical analysis proved to be correct): he had, in effect, chosen the species with the highest concentration of tryptamines as ascertained by his tasting and smelling the cut bark.

It is obvious from our field observations in 1970 (Schultes & Swain, 1976) and 1977 that it is not the trees producing the most red resin that give the best preparation for inebriating effects or even contain the highest amount of tryptamines. Indeed, the *Virola* tree which produced the most copious amount of resin proved to contain no tryptamines either in the phloem or in the resin itself, although small amounts were found in the bark.

Among the Boras, the first step consists in stripping bark from the trunk of the tree and carrying it back to the house for immediate processing. If the tree is standing in water (during the season of high water), the bark is stripped directly from the standing tree from a dugout canoe; if the tree grows on high land, the tree is usually felled for stripping. Strips of bark approximately two and a half feet long are cut from the tree with a machete, usually — and undoubtedly only for convenience — from the lower four to eight feet of the trunk. If an unusually large amount of paste is to be prepared, bark is taken from other parts of the main trunk.

This primary operation stands in sharp contrast to the Witoto method employed on the Karaparaná where, in the forest, the shiny cambial layer left of the inner surface of the strips of bark and that are still adhering to the decorticated trunk is rasped off with the back of a machete, and the raspings are gathered carefully in a gourd for processing in the house (Schultes & Swain, 1976).

Upon returning, the Boras chip the hard, brittle outermost layer of bark from each strip, leaving only the thick, softer layer of the inner bark and phloem, called *tem'-bee-ho-o* in Bora. This cortical layer, now turned reddish brown with a congealed, oxidized "resin", is pounded on a log with a wooden mallet, until it is quite shredded. Cut into short pieces of convenient length, these shredded sections of bark are placed in a pot of a two-foot diameter with three or four inches of water at air temperature. They are allowed to soak for one half to three quarters of an hour with occasional kneading. The water soon becomes a chocolate brown colour.

When the colour of the water is sufficiently deep, the pot is slowly brought to a boil and, with the pieces of bark still in the liquid, it is boiled vigorously for about an hour, when the shredded bark is taken out, and, after the liquid is squeezed out back into the pot, it is discarded. The liquid is then boiled with almost constant stirring for another forty-five minutes to an hour, until a richly chocolate-coloured syrup remains. Stirring must be constant and careful towards the very end of the evaporation, so that a thick, sticky but homogeneous paste is left. The Boras call this paste *ko'do*.

We would venture to assume that the Witoto technique is more efficient than that followed by the Boras. The nearly colourless liquid which rapidly turns reddish or brownish and which, for lack of a better term, we have called "resin", is present only in or near the cambial layer, not in the outer layers of bast or phloem. It is clear that the active principles themselves — the tryptamines — occur mainly in the cambial sap and that boiling of the cambial tissue coagulates proteins and perhaps polysaccharides. When only this delicate cambial tissue is present, as in the Witoto method, it is obvious that such coagulation must proceed more efficiently than when, as in the Bora method, most of the material — consisting of shredded outer phloem — is relatively inert.

The paste may be ingested directly without any further elaboration. If the drug is to be kept for later use, however, the paste is made into small balls or pellets and rolled in a white or greyish powder referred to as "salt" or, in Bora, *ü'-meh* or

oo'me. This "salt" is the residue from the filtrate of ashes of one of two plants: one, known as *pee-ye-ee-pa-a* in Bora, an epiphytic species of the cyclanthaceous genus *Carludovica*, the leaves and stump of which are burned; the other a large palm, *Scheelea* sp., the leaves of which are reduced to ashes. The ashes of these plants are placed in a funnel made of a pliable piece of bark. Hot water is slowly poured into the funnel, passing through the ashes and dripping out into a receptacle placed under the funnel. The filtrate is then evaporated by heating, leaving the solid powder or "salt".

Another contrast with the Karaparaná Witoto preparation of *Virola* pellets lies in the much larger number of plants employed by the Witotos as sources of the "salt" for coating the paste.

It is of interest to note in passing that a "salt" from ashes of the leaves and stems of a low palm of the genus *Chelyocarpus* is similarly prepared by the Boras on this region for mixing with the thick syrup of tobacco, known in Bora as *am-pi'-ree*, applied to the tongue frequently during the use of the powdered coca, a narcotic characteristic of the region. The same tobacco preparation — with "salts" prepared from other plants — is made by the Witotos of the Ríos Karaparaná and Igaraparaná (Schultes, 1945).

The Bora group at Brillo Nuevo recognized several species of *Virola* but pointed out as the "best" tree a species that occurs abundantly along the banks of the Río Yaguasyacu. This "best" tree has been identified as *Virola elongata* (Benth.) Warburg (*Plowman, Schultes et Tovar* 7263). It is a stout, columnar tree up to 75 or 80 feet tall, with a diameter of two to two and a half feet, standing in deep water during most of the rainy season. The crown is not extensive for a tree of such height. The leaves are narrowly lanceolate-elliptic, greyish brown on the nether surface, bright green above; their consistency is firmly chartaceous. The bark is hard, externally greyish black, light reddish brown within, about one quarter of an inch thick; when stripped from the trunk for use, an almost colourless resin-like liquid accumulates on the innermost surface and rapidly — within four or five minutes, some times even

sooner — becomes a rich brownish red. The local name of this tree in Spanish is *cumala blanca*; the Boras call it *ko-de-ko*, apparently a generic term for *Virola*.

Several other species of *Virola* were indicated by these Boras, and paste was prepared from them. It was obvious that there was some confusion as a result of discontinuation of the native use of *Virola* in witchcraft. The species indicated were *Virola surinamensis* (Rol.) Warburg (*cumala colorada*) (Plowman, Schultes et Tovar 7260) and *V. loretensis* A. C. Smith (Plowman, Schultes et Tovar 7259).

At the Bora town of Tierra Firme on the Río Ampiyacu, the species indicated as the basis for the inebriating preparation were: *Virola Pavonis* (DC.) A.C. Smith (Plowman, Schultes et Tovar 7091) and *V. elongata* (Plowman, Schultes et Tovar 7092). The very “strongest”, these natives indicated, is represented by Plowman, Schultes et Tovar 7094, a sterile collection which we cannot identify and which may be an undescribed species of *Virola*. At Tierra Firme, *Virola calophylloidea* Markgraf (Plowman, Schultes et Tovar 7093) and *Osteophloeum platyspermum* (DC.) Warburg (Plowman, Schultes et Tovar 7095) were definitely indicated as “cumalas” which are *not* employed in the elaboration of the narcotic paste.

Amongst the Witotos, who live in the relatively new settlement of Puca Urquillo, near the mouth of the Río Ampiyacu, on the other hand, a medicine man pointed out two species of *Virola* as possible sources of the hallucinogenic drug, even though he no longer knew the method of preparing the paste. These two species are: *Virola elongata*, of the forest well above flood level (Plowman, Tovar et Schultes 6920, 6595), and *V. surinamensis*, common along the deeply flooded banks of rivers and creeks as well as on higher level, known as *cumala* (Plowman, Tovar et Schultes 6688, 6920); the Witoto name for both kinds is *oo-koo'-na*. We believe that our informant was confused, and, that actually, the Witotos formerly used only *Virola elongata*.

Very significantly, these Witotos pointed out *Iryanthera macrophylla* (Benth.) Warburg (Plowman, Schultes et Tovar 6919) as also a source of the narcotic paste. This report repre-

sents the first involving the related genus *Iryanthera* as an hallucinogenic group of plants.

Voucher specimens of the *Virolas* cited above have been added to the Economic Herbarium of Oakes Ames in the Botanical Museum of Harvard University, the herbarium in the Museo de Historia Natural "Javier Prado" in Lima, Peru, and the herbarium of the Instituto Nacional de Pesquisas da Amazônia in Manaus, Brazil. The material was determined by Prof. Richard Evans Schultes, Dr. Timothy C. Plowman and Dr. William Rodrigues.

Species indicated in the foregoing discussion:

- Iryanthera macrophylla* (Benth.) Warburg in Nov. Act. Nat. Cur. 68 (1897) 155.
Osteophloem platyspermum (DC.) Warburg loc. cit. 162.
Viola calophylloidea Markgraf in Fedde Repert. 19 (1923) 24.
Viola elongata (Benth.) Warburg in Nov. Act. Nat. Cur. 68 (1897) 178.
Viola lorentensis A. C. Smith in Bull. Torrey Bot. Cl. 60 (1933) 95.
Viola Pavonis (DC.) A.C. Smith in Brittonia 2 (1938) 504.
Viola surinamensis (Rol.) Warburg in Nov. Act. Nat. Cur. 68 (1897) 208.

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- Schultes, R. E. and T. Swain "De plantis toxicariis e Mundo Novo tropicale commentationes XIII. Further notes on *Virola* as an orally administered hallucinogen" in *Journ. Psyched. Drugs* 8 (1976) 317-324.

PLATE 56

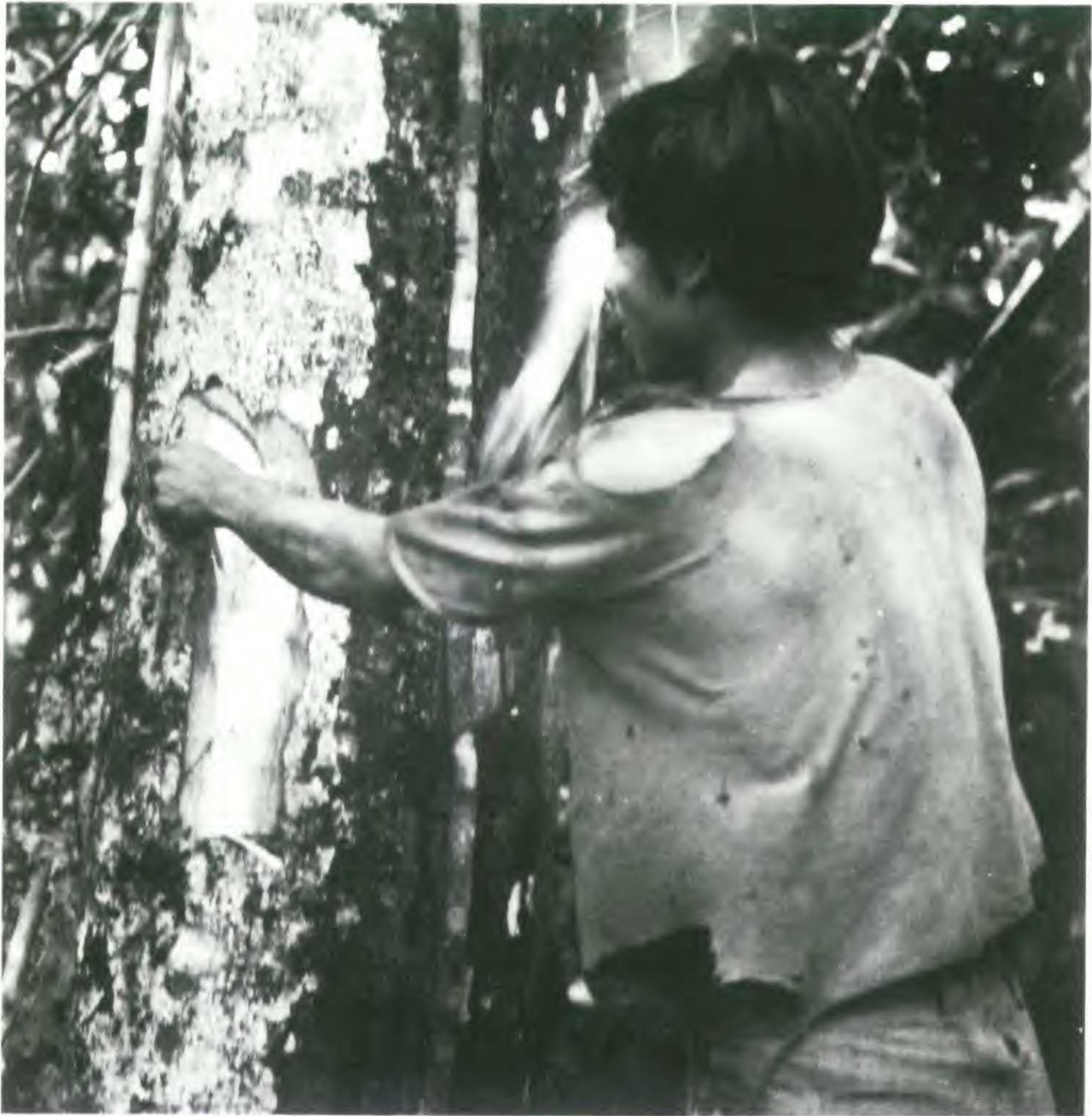


Plate 56. Bora Indian stripping bark from trunk of *Virola elongata* for preparation of hallucinogenic paste. Brillo Nuevo, Rio Yaguasyacu, Loreto, Peru. Photograph: R. E. Schultes.

PLATE 57

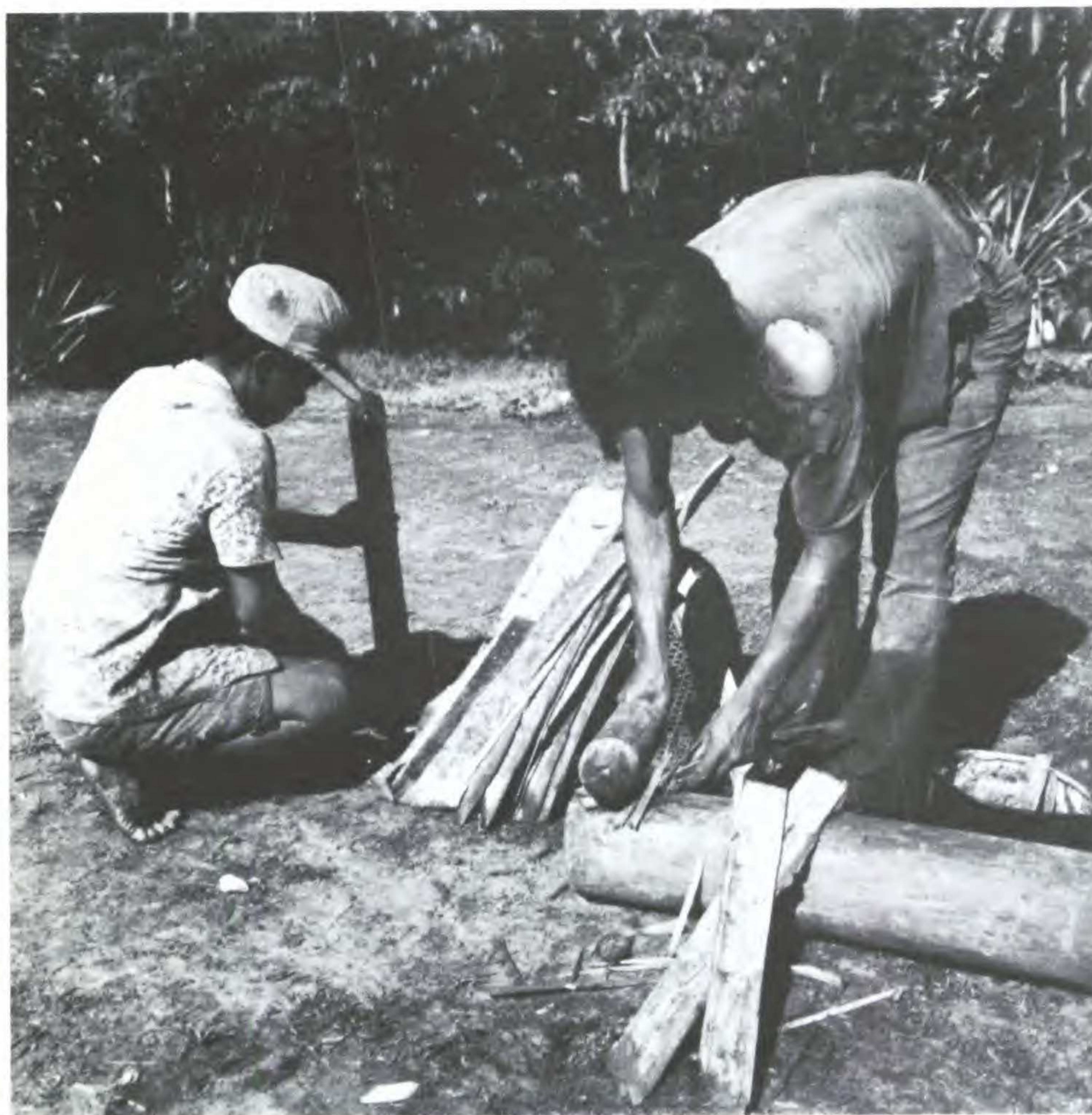


Plate 57. Bora Indians pounding strips of *Virola* bark to separate the inner portion for boiling. Brillo Nuevo, Rio Yaguasyacu, Loreto, Peru. Photograph: R. E. Schultes.

PLATE 58



Plate 58. Inner part of *Virola* bark stripped from whole bark and macerated, ready for boiling. Brillo Nuevo, Rio Yaguasyacu, Loreto, Peru. Photograph: R. E. Schultes.

PLATE 59



Plate 59. Appearance of *Virola* bark after one hour of boiling and stirring in Bora method of preparation of hallucinogenic paste. Brillo Nuevo, Rio Yaguasyacu, Loreto, Peru. Photograph: R. E. Schultes.

PLATE 60



Plate 60. Apparatus used by Bora Indians in preparing the "salt" or filtrate of ashes for coating pills of *Virola* paste. Brillo, Nuevo, Río Yaguasyacu, Loreto, Peru. Photograph: R. E. Schultes.